

## Safety and Outcomes Following Surgical Resection of Butterfly Glioblastomas

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### Introduction

Butterfly glioblastoma (bGBM) is a rare type of glioblastoma (GBM), characterized by a butterfly pattern on MRI studies due to bi-hemispheric involvement and invasion of the corpus callosum (CC). There is a profound gap in our knowledge regarding optimal treatment approach, safety, and survival benefits of surgical resection for treating this aggressive tumor.

### Methods

1746 patients with GBM treated at our institution were retrospectively analyzed from 2004-2014. Records were reviewed for examples of bGBM. GBMs with invasion of CC without involvement of the contralateral hemisphere and bilateral GBMs without involvement of CC were excluded from the study.

### Results

Forty two cases of bGBM were identified with mean age at diagnosis of 57.8 years. Headache and confusion were the most common presenting symptoms (47% and 33% respectively). The median overall survival was 3.2 months from diagnosis with overall 6-months survival rate of 38.1%. Age, KPS at diagnosis, pre-operative tumor volume, and extent of resection significantly impacted survival in univariate analysis. On multivariate analysis, pre-operative tumor volume and treatment approach of resection vs. biopsy were identified as independent prognostic factors regardless of patient-specific characteristics. Surgical resection and biopsy were performed on 33.3% and 59.5% of patients respectively. Surgical resection conferred a better prognosis compared to biopsy (HR=0.37, P=0.009) with minimum extent of resection of 86% to observe survival benefits (HR=0.054, P=0.03). The rate of persistent neurologic deficits from surgical resection was 7.14%. Patients younger than 70 years had a better prognosis (HR= 0.32, P=0.003). Patients receiving resection and adjuvant chemoradiation had better prognosis compared to patients that lacked one of these three treatment modalities (HR=0.34, P=0.015).

### Conclusions

Surgical resection of bGBM is associated with low persistent neurological deficits, with improvement in survival compared to biopsy. More aggressive treatment approach involving aggressive surgical resection and adjuvant chemoradiation has significant survival benefits and improves outcome.

### Learning Objectives

By the conclusion of this session, participants should be able:

- 1) Describe clinical features and survival outcomes of butterfly glioma patients
- 2) Identify important prognostic factors for this patient population
- 3) Discuss optimal treatment approach, safety, and survival benefits of surgical resection.

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